REMARKS

Claims 6, 8, 9, and 10 have been amended for clarification purposes and claims 12-19, 23, 25-28 and 31-34 have been canceled. New claims 36-48 have been added. These amendments are not intended to narrow the scope of these claims. The claims have been rewritten to place them in better form for examination and to further obviate the 35 U.S.C. §112 rejections set forth in the Office Action dated September 10, 2002. It is believed that none of these amendments constitute new matter. Withdrawal of these rejections is requested.

Claims 1 and 19 were objected to and dependent claims 2-18, 23, 25-28 and 31-34 for failing to recite the complete Accession information. Applicant acknowledges the requirement for a deposit of biological material. Upon allowance of the claims in this application, the deposit will be made with American Type Culture Collection. As stated in the specification on page 23, the seed deposit is being maintained by AgReliant Genetics at their Lebanon, Indiana facility. The deposit will be available to the Commissioner during the pendency of this application and upon allowance of any claims, deposit of the corn seed will be made with the American Type Culture Collection.

The undersigned avers that:

a) access to the invention will be afforded to the Commissioner during the pendency of the application;

b) all restrictions upon availability to the public will be irrevocably removed upon the granting of a patent;

c) the deposit will be maintained in a public depository for a period of 30 years or 5 years after the last request or for the enforceable life of the patent, whichever is longer;

d) a test of the viability of the biological material at the time of deposit; and

e) the deposit will be replaced if it should ever become inviable or when requested by ATCC.

Accordingly, withdrawal of these rejections is requested.

The Examiner has rejected claims 8-10, 14-28 and 31-34 under 35 U.S.C. §112, second paragraph as being indefinite. Applicant has amended claims 8-10 as suggested

by the Examiner. Claims 14-28 have been canceled. Withdrawal of this rejection is respectfully requested.

The Examiner has rejected claims 10, 23 and 28. Applicant has amended claim 10 and claims 23 and 28 have been canceled.

Claims 14 and 17-18 are rejected in the recitation of "said hybrid corn". Applicant has canceled claims 14, 17 and 18.

Claim 15 is rejected. Applicant has canceled claim 15.

Claims 19-24 remain rejected as the metes and bounds of what is retained in "MNI1-derived" corn plants. Applicant has canceled claims 19-24. Accordingly, withdrawal of these rejections is respectfully requested.

Claims 25-26, 31 and 33 are rejected as being unclear. Applicant has canceled claims 25, 26, 31 and 33 in favor of new claims 36-48. Withdrawal of this rejection is requested.

Claim 26 and 27 are rejected as indefinite. Applicant has canceled claims 26 and 27.

Claims 33 and 34 are rejected as indefinite. Applicant has canceled claims 33 and 34. Withdrawal of these rejections are requested.

The Examiner has rejected claims 25-28 and 31-34 under 35 U.S.C. §112, first paragraph for enablement. Applicant has canceled claims 25-28, and 31-34. Withdrawal of this rejection is requested.

Claims 6, 12-14, 16-18, 23, 25-28 and 31-34 have been rejected under 35 U.S.C. §112, first paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has amended claim 6 and canceled claims 12-14, 16-19, 23, 25-28 and 31-34 in favor of new claims 36-48. Withdrawal of this rejection is respectfully requested.

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Assignee, Limagrain Genetics Grande Cultures presents its views in support of new claims 36 and 37 as well as reasons for canceling claims 19-25 and 28-30:

"A plant variety as used by a person skilled in the art of plant breeding means a plant grouping within a single botanical taxon of the lowest known rank which can be defined by the expression of the characteristics resulting from a given genotype for an inbred variety or combination of genotypes for an hybrid variety.

An inbred variety, or inbred line, has been created through multiple cycles of self pollination and is therefore considered a homozygous line. The genome of such a line has identical alleles for all loci of homologous chromosomes and contains the same linear sequences of genes, each gene being present in duplicate.

As long as the line is self pollinated, the genome is stable and remains identical from generation to generation. Similarly, the genotype being expressed through the phenotype, as long as the arrangement and the organization of the genes remain stable through strictly controlled self pollination, the phenotype will remain stable as well. The same characteristics will then be expressed from generation to generation and will therefore be predictable.

The inbred line is a combination of phenotypic characteristics issued from an arrangement and organization of genes created by a person skilled in the art through the breeding process. Claims on inbred lines per se relate to this invention.

An hybrid variety is classically created through the fertilization of an ovule from an inbred parental line by the pollen of another, different inbred parental line. Due to the homozygous state of the inbred parental genome, all gametes, whether pollen or ovules, produced by a given inbred line will carry a copy of each parental chromosome and be therefore genetically identical carrying a copy of every gene as arranged and organized in the original genome of the parental inbred line.

Therefore, both the ovule and the pollen bring a copy of the arrangement and organization of the genes present in the parental lines. The genome of

each parental line is present in the resulting hybrid (also known as F1 hybrid) in the same arrangement and organization as created by the plant breeder in the original parental line. The cross between two different inbred parental lines is therefore predictable, it will contain fifty percent of the genome of each inbred parental line. In addition, and as long as the homozygosity of the parental lines is maintained, the resulting hybrid cross will be stable, whether genetically or phenotypically.

The F1 hybrid is a combination of phenotypic characteristics issued from two arrangement and organization of genes, both having been created by a skilled artisan/plant breeder through the breeding process. Each arrangement and organization of the genome is present in the F1 hybrid as it has been created by the breeder in the inbred.

For a plant breeder skilled in the art of corn breeding, the creation of an F1 hybrid is therefore highly predictable. For example, dominant alleles present and expressed in an inbred line, will be brought by the gamete and expressed by the F1 hybrid. Therefore claims 36 and 37 meet the provisions of 35 U.S.C. §112.

When an F1 hybrid variety is used for further breeding, as mentioned in canceled claims 19 to 25, also known as "progeny claims" or in the breeding methodologies of canceled claims 28 to 30, the situation changes. The genome of an F1 hybrid is composed by a copy of the genetic maternal material, bought by the ovule and a copy of the genome of the genetic paternal material, bought by the pollen. The genome of the F1 hybrid can be reproduced by crossing the inbred parental lines and is identical as long as the homozygosity of the inbred parental lines is safeguarded.

However, when the F1 hybrid itself produces gametes, the phenomenon that takes place during the meiosis will lead to gametes that are different and totally unpredictable in the arrangement and organization of the genes carried out. As a result, the F2 generation, whether produced by auto-pollinating the F1 hybrid (the pollen produced by F1 hybrid fertilizes the ovule

produced by the same F1 hybrid) or by inter-crossing two different F1 hybrids (the pollen produced by one F1 hybrid fertilizes an ovule produced by another, different F1 hybrid), will be genetically and phenotypically different from one resulting F2 plant to another and also from the parental F1 hybrids. Similarly, subsequent generation, usually known by a man skilled in the art as F3, F4, F5, ... Fn or "progeny", will be from one generation to the next, more and more genetically and phenotypically different because of the increasing number of meiosis phenomenon.

First, due to the chromosome recombination, the gametes created through the meiosis will have an arbitrary content of maternal or paternal origin of the chromosomes. The different chromosomes segregating independently, the gametes will all have the same number of chromosomes, but with a different ratio of maternal or paternal origin. This part of the meiosis only will lead to gametes, whether ovules or pollen, that have different genetic content. The larger the number of chromosomes, the more chromosomal recombination occurs.

Second, and in addition, the homologous recombination process will lead to the exchange, also known as crossing over of numerous DNA regions by their homologous DNA sequences from the homologous chromosome. This second part, resulting from the exchange between chromatids paired chromosomes, will complete the melange of the genes and lead to gametes that definitively have different genetic background. The genes are randomly rearranged and the genetic information carried by the gamete is then totally unpredictable.

As long as both copies of the chromosome have the same information, as it is the case for an inbred, these phenomena do not lead to any changes in the genomes and all gametes produced are identical.

But for progeny from an F1 hybrid which chromosomes copies originate from different inbreds, both processes will lead to different gametes, having parts of their genome originating from one inbred, other parts originating from

the other inbred.

Therefore the arrangement and organization created by the plant breeder in the original parental line, that was also present in the F1 hybrid is lost when the gametes from the F1 plant are produced. The arrangement and organization of the genome in the gamete, but also in the subsequent F2, F3, F4, Fn and progeny generation plant produced through fertilization and development of the embryo is completely random.

Therefore, as the arrangement and organization created by the plant breeder in the original parental line is lost, the phenotypic expression of said genetic organization is lost and the F2, F3, F4, Fn plants, seeds and progeny after the initial F1 hybrid are different from the original inbred and F1 hybrid. There is no way to predict what can be the outcome of such a progeny, what can be its genetic organization or how this organization can be expressed by the plant. As the integrity of the arrangement and organization of the F1 genome is no longer present in the F2, successive generations and progeny, as the genomic organization and the phenotypic expression resulting thereof are completely unpredictable. Given the predictability, for a plant breeder skilled in the art of corn breeding, to create an F1 hybrid by crossing two inbred lines, therefore new claims 36 and 37 meet 35 U.S.C. §112 requirements. On the contrary given the unpredictability of F2, successive generations and progeny, therefore claims 19-25 and 28-30 are canceled.

If Examiner or its Supervisor are interested in further discussing this subject, Assignee, Limagrain Genetics Grande Cultures is willing to meet with them at their convenience."

* *

Claims related to corn plant comprising single gene conversion, namely claims 31 to 34 have been objected by examiner as containing subject matter which was not described in such a way as to enable one skilled in the art to which it pertains to make and/or use the

invention. These claims have also been rejected for being indefinite and using "single gene conversion".

Applicants submit that the present invention is in the plant breeding art and that for the man skilled in the art, i.e. a plant breeder, the single gene conversion is commonly done i.e. as introgression of a desired trait in a plant through breeding method.

The meaning and definition of "single gene conversion" as used in the present invention has been widely used in more than 250 United States patents previously granted by the patent office. For example in Foley, US Patent No 5,973,239 which document has been cited by the examiner, the single gene converted or conversion plant is defined as referring to plants which are developed by a plant breeding technique called backcrossing wherein essentially all of the desired morphological and physiological characteristics of an inbred are recovered in addition to the single gene transferred into the inbred via the backcrossing technique. It is well know in the art of plant breeding how single genes can be used in a conversion process, i.e. in a backcross breeding method. For example, the waxy (wx) gene is a recessive single gene that is used in corn breeding to create corn varieties where the starch content is 100% composed by amylopectin whereas normal corn contains 75 percent amylopectin and 25 percent amylose. Another example is the Opaque-2 gene, another single gene used to produce High Lysine corn that contains increased levels of two amino acids--lysine and tryptophane. Applicant would further highlight that neither the waxy gene nor the Opaque-2 gene are transgene.

Applicant respectfully disagrees with examiner regarding the unpredictability of the introgression of genes or genes into the genetic background of a different plant. Accordingly to Hallauer, A.R. et al. (1988) "Corn Breeding" Corn and Corn Improvement, No. 18, pp. 472, backcross method of breeding is an important component of most breeding program that counted, in 1981 for 17% of the total breeding effort for inbred line development. In addition, the complexity of the backcross method depends on type of traits being transferred, but that for single genes, the backcross method is effective and easy to manage. Therefore, applicant submits that one skilled in the art, i.e. a plant breeder shall readily use the corn line of the present invention for backcrossing leading to a an MNI1 corn plant further comprising a single gene conversion.

Claims 12-14, 16-18 and 25-28 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Foley (U. S. Patent 5,973,239). Applicant has canceled claims 12-14, 16-18 and 25-28. Applicant respectfully requests withdrawal of this rejection.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

In view of the above amendments and remarks, it is submitted that the claim satisfies the provisions of 35 U.S.C. §§102, 103 and 112 and is not obvious over the prior art. Reconsideration of this application and early notice of allowance is requested.

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Attachments: Marked-Up Copies of Claims

AMENDED CLAIMS - Version with markings to show changes made

Please cancel claims 12-19, 23, 25-28 and 31-34.

Please amend claims 6, 8, 9 and 10.

Please add new claims 36-48 as shown below:

6. (AMENDED) The corn plant of claim 2, wherein said plant is ~~male sterile~~ detasseled.

8. (AMENDED) The tissue culture of claim 7, the cells or protoplasts of ~~the tissue culture being from~~ said cells having been isolated from a tissue selected from the group consisting of protoplast and calli, wherein the regenerable cells are derived from meristematic cells, leaves, pollen, embryo, roots, root tip, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.

9. (AMENDED) A corn plant regenerated from the tissue culture of claim 7, capable of expressing all the morphological and physiological characteristics of inbred corn plant MNI1, wherein a sample of said seed has been deposited under ATCC Accession number _____.

10. (AMENDED) A corn plant with all the morphological and physiological characteristics of inbred corn plant MNI1, wherein said corn plant is produced by a tissue culture process obtaining ~~using~~ the corn plant of claim 5 as the starting material for said ~~such a~~ process.

36. (NEW) A hybrid corn seed wherein fifty percent of its genetic material originates from the pollen of claim 3.

37. (NEW) A hybrid corn seed wherein fifty percent of its genetic material originates from the ovule of claim 4.

38. (NEW) A method for producing a transgenic corn plant comprising transforming the corn plant of claim 2 with a transgene wherein the transgene confers a characteristic selected from the group consisting of: herbicide resistance, insect resistance, resistance to bacterial disease, resistance to fungal disease, resistance to viral disease, male sterility and corn endosperm with improved nutritional quality.

39. (NEW) A transgenic corn plant produced by the method of claim 38.

40. (NEW) A method of producing a male sterile corn plant comprising transforming the corn plant of claim 2 with a transgene that confers male sterility.

41. (NEW) A male sterile corn plant produced by the method of claim 40.

42. (NEW) A method of producing an herbicide resistant corn plant comprising transforming the corn plant of claim 2 with a transgene that confers herbicide resistance.

43. (NEW) A herbicide resistant corn plant produced by the method of claim 42.

44. (NEW) A method of producing an insect resistant corn plant comprising transforming the corn plant of claim 2 with a transgene that confers insect resistance.

45. (NEW) An insect resistant corn plant produced by the method of claim 44.

46. (NEW) A method of producing a disease resistant corn plant comprising transforming the corn plant of claim 2 with a transgene that confers disease resistance.

47. (NEW) A disease resistant corn plant produced by the method of claim 46.

48. (NEW) The corn plant of claim 5, further comprising a single gene conversion where the gene confers a characteristic selected from the group consisting of: male sterility, herbicide resistance, insect resistance, resistance to bacterial disease, resistance to fungal disease, resistance to viral disease and corn endosperm quality.